

SYSTEM FOR FIXING ROTARY CUTTING DIES IN
MACHINES FOR DIE CUTTING LAMINAR MATERIAL

5

DESCRIPTION

Technical Field

PURPOSE

The present invention relates

10 This descriptive report refers to a system for fixing rotary cutting dies in machines for die cutting laminar material, the purpose of which lies in its configuration as a system that permits fixing rotary cutting dies on the cylinders or cutting die supports
15 in machines for die cutting laminar material.

SCOPE

20 This invention is applied within the industry dedicated to the manufacture of die cutting machines, especially machines for die cutting laminar material.

Background Art

HISTORY

25 In rotary cutting die machines, the material to be cut, for example cardboard for making boxes, is moved between a cutting die support cylinder and a counter-cutting die cylinder or anvil, also rotary, so that at each turn of the cylinders the cutting die 30 falls on the counter-cutting die and makes a cut or warping on the cardboard.

the problem of

To avoid that the cutting die becomes damaged by the blow, the surface of the counter-cutting die is 35 provided with a polyurethane coating.

At present, the rotary cutting dies are fixed on the cutting die support by means of screws that are coupled to the corresponding screw holes made on the 5 surface of the cutting die support cylinder.

A ~~of being~~ This fixing system has the main inconvenience that it is excessively slow, as a considerable number of screws has to be placed.

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The statement made in the above paragraph confirms that the stopping time of the machine when a new cutting die has to be mounted is excessive and this affects the productivity of the rotary cutting 15 die machine.

Summary

DESCRIPTION OF THE INVENTION

The system for fixing rotary cutting dies in 20 machines for die cutting laminar material proposed by the invention is formed in itself as an obvious novelty that manages to resolve the above mentioned inconvenience and, furthermore, presents other advantages to be described later on.

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The system for fixing rotary cutting dies in machines for die cutting laminar material, ~~purpose of this invention~~, includes fixing means between the cutting die and a cutting die support cylinder, where 30 the fixing means has a number of bolts operated by a driving device.

This characteristic permits rapid fixing of the rotary cutting die to the cutting die support 35 cylinder, with the result that the shutdown time of the machine to change the cutting die is less than at

present; thus,

~~present~~, improving the productivity of the cutting die machine.

The system of the invention also has the 5 peculiarity that each of the working devices is housed inside a hollow body fixed to the cutting die support cylinder.

Because of

~~Thanks to~~ this characteristic the manufacturing 10 costs of the cutting die machine are not overexpensive, in turn permitting that maintenance and mechanization of the machine are quick and easy.

Preferably, the working devices are also dynamic 15 fluid cylinders that operate independently in the two halves of the cutting die support cylinder.

According to their performance, the dynamic fluid cylinders are pneumatic or hydraulic cylinders and 20 ~~it is~~ ^{that} also preferred ^{the} working devices ~~are~~ ^{be} dynamic fluid cylinders that operate independent of the two halves of the cutting die support cylinder.

Likewise, according to their performance, the 25 dynamic fluid cylinders are pneumatic or hydraulic cylinders and it should be indicated that it is also preferred that the bolts are placed on the rotary cutting die in ~~circumference~~ ^{a grid pattern} with the result that the bolts occupy the whole surface of the cutting die in a 30 uniform way.

According to a performance, the system of the invention also includes screwed drill holes to fix the rotary cutting die to the cutting die support 35 cylinder, placing these screwed drill holes to ensure fixing of the rotary cutting die to the cutting die

support cylinder in the event the system ~~purpose of~~
~~this invention~~ is not used.

Preferably, the drill holes are also placed on
5 the cutting die support cylinder in ~~quincunxes~~,
occupying the places that have not been used by the
bolts.

Brief
A
DESCRIPTION OF THE DRAWINGS

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To complement the description which follows and
in order to help with a better understanding of the
characteristics of the invention, this descriptive
report includes a set of drawings in which the
15 following is represented in an illustrative but not
limiting ~~way~~.

Figure 1 shows an elevated section view of a
working device.

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Figure 2 shows a ~~view in perspective~~ *perspective view*
of a cutting die placed on a cutting die support cylinder.

25

Figure 3 shows a ~~detail~~ *detailed view*
of the cutting die on the cutting die support
cylinder.

Figure 4 shows a fixing hole of the cutting die.

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Figures 5, 6, 7 and 8 correspond to elevated
section views of the four working positions of the
working device relating to the system for fixing
rotary cutting dies in machined for die cutting
laminar material. ~~the purpose of this invention~~.

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Detailed Description of the Drawings

PREFERRED PERFORMANCE OF THE INVENTION

A 1

5 In view of these figures, it can be seen how the system for fixing rotary cutting dies in machines for die cutting laminar material is made up of rotary cutting dies (1) which are fixed to cutting die support cylinders (2) by means of a number of bolts
 10 10 (3) worked by a pneumatic cylinder (5).

The bolts (3) are fixed to the piston (6) of the pneumatic cylinder (5) by a screw nut (4) the head (7) of which has a larger diameter that fixes the cutting
 15 die (1) to the cutting die support cylinder (2).

The pneumatic cylinders (5) are housed inside two hollow bodies (8) and each of these hollow bodies (8) is fixed to the cutting die support cylinder (2) by
 20 means of four fixing screws (10).

As can be seen in figure 2, the bolts (3) are placed on cutting die support cylinders (2) and on the rotary cutting die (1) in ~~in punctures~~ ^{a grid pattern}, so that they
 25 occupy the whole surface of the cutting die (1) in a uniform way.

In figure 3 it can be seen that, in order to center the cutting die (1) on the cutting die support cylinder (2), ~~this has~~ ^{there is} a circumferential ^{stop} (19) and an axial ^{stop} (20) for centering the cutting die (1), whilst the cutting die (1) has a centering guide (21).

The fixing system can also include screwed drill
 35 holes (22) to fix the rotary cutting die (1) to the cutting die support cylinder (2) and, in this case,

the screwed drill holes (22) are also placed on the cutting die support cylinder (2) and on the rotary cutting die (1) in ~~a quincunx~~ ^{a grid pattern}, occupying the places that have not been previously occupied by the bolts (3).

At the bottom of each pneumatic cylinder (5) there is an orifice (11) connected to a duct (12) for injecting pressurized air. In the event that the bolt 10 (3) does not find any hole (15) in the cutting die (1) through which it can exit, the system of the invention has a hollow piston (6) that has a spring (14) inside which gives way and permits the bolt (3) to remain hidden inside the piston (6) and in a hollow (18) in 15 the lid (9) of the pneumatic cylinder. This lid (9) is fixed to the cutting die (1) with the same screws (10) as the hollow body (8).

20 The holes (15) of the cutting die (1) have a ~~notice~~ ^{bolt notch} (16) provided with an adapter (17) in the shape of the head (7) of the bolt (3).

25 The different work stages of the working devices can be seen in figure 5.

25 The above mentioned stages of the working devices are as follows:

A *Stage. While*
 First ~~stage~~ whilst the pneumatic cylinder 30 (figure 5) has no pressurized air, the spring (13) pushes the bolt (3) towards the inside of the hollow body (8). The cutting die (1) is placed on the cutting die support cylinder (2), butting against the circumferential ~~stop~~ ^{Stop} (19) and the centering axial ~~stop~~ ^{stop} (20) of the cutting die support cylinder (2).

A stage. The

Second ~~stage~~ The pneumatic cylinder, as shown in figures 6 and 7, receives the pressurized air through an orifice (1) made at the bottom of the 5 pneumatic cylinder (5), connected to a duct (12), driving this pressurized air upwards to the piston (6) and, at the same, the bolt (3), thus overcoming the stress of the spring (13), as shown in figure 7.

10 In the hypothetical case that the outlet of the bolt (3) was obstructed, the pressurized air would continue to overcome the stress of the spring (13), thus maintaining the piston up, but the bolt (3) would remain hidden inside the piston (6), thus placing 15 ~~little~~ ^{small} pressure produced by the spring (14) on the cutting die (1), as shown in figure 6.

20 ~~Stage (2)~~ Third stage - In this stage the cutting die (1) must be moved axially towards the position of the ~~bolts~~ ^{notch} (16) and then ~~eliminate~~ the pressurized air from inside the pneumatic cylinder, ~~thus~~ obtaining ^{is eliminated} that the spring (13) ~~works~~ expands and in this way moves the piston (6) and the bolt (3) towards the inside of the cutting die support cylinder (2), thus fixing the head 25 (7) of the bolt (3) and the cutting die (1) to the cutting die support cylinder (2), as shown in figure 8.